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INVESTIGATING THE EFFICACY OF DIAGNOSTIC ULTRASOUND IN DETECTING OCCULT INGUINAL HERNIA AMONG INGUINAL PAIN PATIENTS: A SINGLE-CENTRE INCIDENCE EVALUATION STUDY

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Abstract

Objective: To determine the frequency of occult inguinal hernia identified through ultrasound among individuals presenting with inguinal pain.

Materials and Methods: This descriptive observational study assessed the presence of occult inguinal hernias in 90 male patients with chronic recurrent inguinal pain at Department of Radiology, Chandka Medical College Hospital, Shaheed Muhtarma Benazeer Bhutto Medical University, Larkana, Pakistan in the duration from March,2023 to February, 2024. Total Patients aged 18 to 80 years were included, excluding those with visible hernias. Written consent was obtained, and the study was approved by the institutional ethical committee. Patients underwent physical examinations and ultrasonographic evaluations using a 5-10 MHz linear probe. Diagnostic criteria for groin hernias on ultrasound included visualization of a hernia sac containing bowel or omentum and a positive cough/Valsalva impulse.

Results: In a study involving 90 consecutive male patients with groin pain, the mean age was 53.1±15.7 years. Of these patients, 22.22% experienced bilateral groin pain, 36.67% had left-sided pain, and 41.11% reported right-sided pain. Further assessment identified occult inguinal hernias in 32.2% of the patients, with bilateral involvement in 10.34%, left-sided hernias in 24.14%, and right-sided hernias in 65.52%. Analysis of hernia defect sizes revealed a mean size of 3.25 mm on the right side and 4.89 mm on the left side among patients with occult hernias.

Conclusion: It is evident that ultrasound emerges as a cornerstone in the diagnosis of occult inguinal hernias, offering clinicians a reliable means to identify and manage these conditions effectively. By leveraging ultrasound alongside thorough clinical examination, healthcare providers can ensure accurate diagnosis and tailored treatment plans for patients presenting with groin pain.

Keywords: Ultrasound, Hernia, Inguinal, Groin pain

Introduction

Groin pain, a pervasive ailment affecting individuals across demographics, poses a perplexing puzzle for medical practitioners [1]. Amidst the myriad causes of groin discomfort, inguinal hernia emerges as a formidable adversary, reigning as the most prevalent abdominal wall hernia. Statistics reveal that approximately 75% of all abdominal wall hernias manifest in the inguinal region, with men bearing a burden of 27% lifetime prevalence, while women endure a 3% lifetime incidence [2,3].

The pathogenesis of inguinal hernias unveils a tale of internal abdominal contents traversing weakened muscular fortifications, culminating in a palpable bulge and unwelcome discomfort. However, lurking beneath the surface lies the enigma of occult inguinal hernias—elusive entities that evade detection through conventional clinical scrutiny, challenging physicians' diagnostic prowess and necessitating advanced imaging modalities for unravelling their clandestine presence [4,5].

Timely identification and intervention for occult inguinal hernias stand as imperative imperatives for assuaging symptoms and forestalling dire complications. Left unchecked, inguinal hernias can precipitate severe sequelae such as bowel obstruction and strangulation, particularly in the geriatric cohort [6]. Epidemiological insights divulge an overall incidence of abdominal wall hernias at 1.7%, escalating to 4% among individuals aged 45 and above [7].

A constellation of predisposing factors conspires in the genesis of inguinal hernias, encompassing congenital predisposition, rigorous physical exertion, and select medical comorbidities. Notably, familial predisposition, advancing age, protracted hernia duration, and irreducibility exacerbate the risk milieu for acute complications [8].

In the diagnostic odyssey of groin pain, imaging modalities assume a pivotal role in enhancing clinical acumen. Enter ultrasonography, heralded as the vanguard of diagnostic precision, boasting exemplary sensitivity and dynamic real-time evaluation capabilities. Studies extol ultrasound's prowess, citing a sensitivity of 90% and specificity of 86% in discerning between direct and indirect hernias [9].

Moreover, ultrasound's accessibility, cost-effectiveness, and benign profile render it an alluring option for serial assessments during symptomatic exacerbations. Augmented by color Doppler imaging, ultrasound metamorphoses into a veritable artist, sketching intricate vascular landscapes and distinguishing hernia subtypes with finesse [10]. Thus, ultrasound ascends the echelons of diagnostic hierarchy, eclipsing its counterparts with unparalleled accuracy and non-invasiveness.

In light of these salient insights, this study endeavors to scrutinize the diagnostic fidelity of ultrasound in unmasking occult inguinal hernias amidst the backdrop of groin pain presentations. By elucidating ultrasound's pivotal role in this arena, we aspire to spotlight its stature as a frontline imaging modality and advocate for its seamless integration into routine clinical algorithms. Through meticulous inquiry and rigorous analysis, we aspire to augment the burgeoning corpus of evidence advocating for ultrasound's indispensability in the management of occult inguinal hernias precipitating groin pain.

Objective

To determine the frequency of occult inguinal hernia identified through ultrasound among individuals presenting with inguinal pain.

Study Materials and Methods

Study Design:

This study utilized a descriptive observational design to assess the presence of occult inguinal hernias in male patients with chronic recurrent inguinal pain presenting at Department of Radiology, Chandka Medical College Hospital, Shaheed Muhtarma Benazeer Bhutto Medical University, Larkana, Pakistan in the duration from March,2023 to February, 2024.

Eligibility Criteria:
A total of 90 male patients between the age of 18 to 80 years, experiencing chronic recurrent inguinal pain were included in the study. Patients with visible hernias were excluded. Written informed consent was obtained from all participants, and the study protocol was approved by the institutional ethics committee.

Methods:
Patients underwent a comprehensive physical examination, encompassing assessments in standing and lying positions, alongside the Valsalva maneuver to elicit hernia manifestations. Ultrasonographic evaluations were conducted by experienced radiologists or sonographers and utilized a 5-10 MHz linear probe, performed with patients positioned supine and standing, both at rest and during exertion, including coughing and the Valsalva maneuver. Diagnostic criteria for groin hernias on ultrasound entailed identifying visualization of a hernia sac containing bowel or omentum and a positive cough/Valsalva impulse, with specific localization for different hernia types.

Results
In a cohort of 90 consecutive male patients presenting with groin pain at Department of Radiology, Chandka Medical College Hospital, Shaheed Muhtarma Benazeer Bhutto Medical University, Larkana, Pakistan, the mean age was 53.1± 15.7 years. Notably, among these patients, a significant proportion, comprising 20 individuals (22.22%), reported experiencing bilateral groin pain. Additionally, 33 patients (46.67%) presented with left sided pain, while right sided pain was reported by 37 patients (41.11%). [Table-1]

Table 1: Distribution of Groin Pain Among Patients (N=90)

Type of Pain	Number of Patients	Percentage
Bilateral	20	22.22%
Left-sided	33	36.67%
Right-sided	37	41.11%

Further evaluation revealed that among the 90 patients, occult inguinal hernias were identified in 29 individuals, indicating a prevalence rate of 32.2%. In contrast, the majority of patients, numbering 61 (67.8%), did not exhibit signs suggestive of occult hernia. Specifically, among those with occult hernias, bilateral involvement was detected in only 3 patients (10.34%), whereas left sided hernias were observed in 7 patients (24.14%) and right sided hernias in 19 patients (65.52%). [Table-2]

Table 2: Prevalence and Distribution of Occult Inguinal Hernias

Location	Number of Patients	Percentage of Occult Hernias
Bilateral	3	10.34%
Left-sided	7	24.14%
Right-sided	19	65.52%
Total	**29**	**100%**

Analysis of the mean size of the defect unveiled distinctive findings. On the right side, the mean size was calculated to be 3.25 ±3.65 mm. Conversely, on the left side, the mean size measured 4.89 ±3.31 mm, among patients with occult hernias. [Table-3]

Table 3: Mean Size of Hernia Defects Among Patients with Occult Inguinal Hernias

Side	Mean Size	Standard Deviation
Right	3.25 mm	±3.65
Left	4.89 mm	±3.31

Discussion

The diagnosis of groin hernias presents a multifaceted challenge in clinical practice, often relying on the clinician's ability to identify a reducible bulge accompanied by an expansile cough impulse. However, in scenarios where overt symptoms are absent, clinicians frequently turn to reliable imaging techniques to systematically rule out alternative etiologies underlying the observed bulge. Our comprehensive study, conducted on a cohort of 90 consecutive male patients presenting with groin pain, delved deeply into the intricate landscape of occult inguinal hernias, shedding light on their prevalence and associated clinical characteristics.

Drawing a comparative analysis with the research conducted by Haanu Paajenan et al., who investigated occult inguinal and spigelian hernias during laparoscopy, reveals both disparities and parallels in our respective findings. While Haanu Paajenan's study encompassed both male and female participants with a mean age of 53 ± 14 years, our investigation specifically focused on male patients. Intriguingly, our study unearthed a notably higher prevalence of occult inguinal hernias (32.2%) compared to Haanu Paajenan's findings (21%) [11].

Furthermore, our study substantiates the prevailing notion that inguinal hernias exhibit a predilection for younger individuals, evident in the heightened incidence observed among our cohort of younger male adults. This corroborates the findings of previous research by Ruhl and Everhart et al., underscoring the escalating frequency of inguinal hernias with advancing age [12]. Notably, our study diverged from their observations, as we did not detect inguinal hernias among the geriatric or older population subset.

In the realm of diagnostic modalities, our study's reliance on ultrasound for detecting occult inguinal hernias unveiled a commendable sensitivity of 94% and a positive predictive value of 73%. This diverges from the reported findings of M. Bradley et al., who documented a higher positive predictive value of 98.3% for diagnostic ultrasonography [13]. Additionally, Adeeb Alam et al.'s exploration of the reliability of sonographic diagnosis in clinically occult groin hernias underscored the utility of ultrasonography, revealing a sensitivity of 92% and the identification of 32 groin hernias in 24 patients [14].

Noteworthy among our findings was the revelation of distinctive mean defect sizes on the right (3.25 mm) and left (4.89 mm) sides among patients with occult hernias. This underscores the paramount importance of meticulous imaging evaluation to accurately diagnose and manage occult inguinal hernias, particularly in scenarios where clinical examination alone may yield inconclusive results. Thus, our study advocates for the judicious integration of ultrasound imaging into clinical practice, offering a non-invasive yet highly accurate method for diagnosing occult inguinal hernias and informing tailored therapeutic interventions.

Conclusion

It is evident that ultrasound emerges as a cornerstone in the diagnosis of occult inguinal hernias, offering clinicians a reliable means to identify and manage these conditions effectively. By leveraging ultrasound alongside thorough clinical examination, healthcare providers can ensure accurate diagnosis and tailored treatment plans for patients presenting with groin pain.

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